Remarks/Arguments

Reconsideration of this application is requested.

Specification

The title is objected to as not descriptive. In response, the title is amended to "Method for Manufacturing Micro Lenses", which is clearly indicative of the invention to which the claims are directed.

Claim Status

Claims 1-10 are pending. Claims 1-4 and 8-10 are withdrawn from consideration as drawn to a non-elected species. Claim 5 is amended.

Claim Rejections – 35 USC 103

Claims 5-7 are rejected under 35 USC 103(a) as obvious over Suzuki (JP 9-27608) in view of Sano (US 6,030,852). In response, applicant traverses the rejections and amends claim 5 to clearly distinguish over Suzuki and Sano.

Claim 5, as amended, recites the following three steps:

(1) etching an underlayer film to form convex regions in the underlayer film (see Fig. 7);

(2) laminating, on the underlayer film, a light transmitting lens film of a shape reflecting a shape of the underlayer film (see Fig. 9); and

(3) forming concave regions over the convex regions of the underlayer film by etch back processing of the lens film.

According to the present invention, micro lenses having a convex shape on top are formed by self-alignment while reflecting the convex shape of the underlayer film. In particular, with a step of isotropic etching as shown in Fig. 8, micro lenses having convex shapes on top and bottom, such as lower lens film 23 of Fig. 12, can be formed by self-alignment, without any difficulty in alignment.

Suzuki fails to include steps corresponding to steps (1) and (2) noted above. Moreover, Suzuki's insulating film 14 is flat. Suzuki contains no disclosure or suggestion of forming micro lenses having a convex shape on top by self-alignment

while reflecting the shape of the underlayer film, unlike the present invention as is reflected in claim 5.

In Sano, although insulating film 6 reflects the shape of the lower layer, BPSG film 2' is laminated by spin coating and without performing etch back processing on insulating film 6. Further, in the boundary between micro lens forming regions, BPSG film 2' is exposed, etched and dissolved to thereby form micro lenses. Thus, Sano also fails to disclose the formation of micro lenses having a convex shape on top by self-alignment while reflecting the shape of the underlayer film.

Because Suzuki and Sano do not disclose or suggest each and every element of claim 5, as amended, claim 5 and claims 6 and 7 dependent thereon are not obvious over Suzuki in view of Sano. The rejections of claims 5-7 under 35 USC 103(a) should therefore be withdrawn.

Conclusion

This application is now in condition for allowance. The Examiner is invited to contact the undersigned to resolve any issues that remain after consideration and entry of this amendment. Any fees due with this response may be charged to our Deposit Account No. 50-1314.

Respectfully submitted,
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